

I claim:

1. A nickel-chromium-molybdenum alloy capable of being age hardened for improved strength while maintaining high corrosion resistance, having a composition comprised in weight percent of:

19.5 to 22	chromium
15 to 17.5	molybdenum
up to 3	iron
up to 1.5	manganese
up to 0.5	aluminum
up to 0.02	carbon
up to 0.015	boron
up to 0.5	silicon
up to 1.5	tungsten

with a balance of nickel and impurities, metallic impurities hafnium, tantalum and zirconium up to 0.5 wt. %, wherein the alloy has a P value of from 33.5 to 35.9, P being defined as:

$$P = 2.64 \text{ Al} + 0.19 \text{ Co} + 0.83 \text{ Cr} - 0.16 \text{ Cu} + 0.39 \text{ Fe} + 0.52 \text{ Hf} + 0.59 \text{ Mn} + 1.0 \text{ Mo} + 0.68 \text{ Nb} + 2.15 \text{ Si} + 1.06 \text{ V} + 0.39 \text{ W} + 0.45 \text{ Ta} + 1.35 \text{ Ti} + 0.81 \text{ Zr}$$

where the elemental compositions are given in weight percent.

2. The nickel-chromium-molybdenum alloy of claim 1, also comprising in weight percent:

up to 2.5	cobalt
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up to 1.25	niobium
up to 0.7	titanium
up to 0.2	vanadium

3. The nickel-chromium-molybdenum alloy of claim 1, comprising up to 3.5 wt.% copper

4. The nickel-chromium-molybdenum alloy of claim 1, wherein the impurities comprise levels of at least one of sulfur, phosphorus, oxygen, nitrogen, magnesium, and calcium.

5. The nickel-chromium-molybdenum alloy of claim 1, wherein the alloy is in wrought forms selected from the group consisting of sheets, plates, bars, wires, tubes, pipes, and forgings.

6. The nickel-chromium-molybdenum alloy of claim 1, wherein the alloy is in cast form.

7. The nickel-chromium-molybdenum alloy of claim 1, wherein the alloy has been spray-formed.

8. The nickel-chromium-molybdenum alloy of claim 1, wherein the alloy is in powder metallurgy form.

9. A nickel-chromium-molybdenum alloy capable of being age hardened for improved strength while maintaining high corrosion resistance, having a composition comprised in weight percent of:

19.9 to 21.4	chromium
15.1 to 17.4	molybdenum
up to 2	iron
0.1 to 0.4	manganese
0.1 to 0.4	aluminum
up to 0.01	carbon
up to 0.008	boron
up to 0.1	silicon
up to 1.0	tungsten

with a balance of nickel and impurities, metallic impurities hafnium, tantalum and zirconium each up to 0.2 wt. %, wherein the alloy has a P value of from 34.0 to 35.9, P being defined as:

$$P = 2.64 \text{ Al} + 0.19 \text{ Co} + 0.83 \text{ Cr} - 0.16 \text{ Cu} + 0.39 \text{ Fe} + 0.52 \text{ Hf} + 0.59 \text{ Mn} + 1.0 \text{ Mo} + 0.68 \text{ Nb} + 2.15 \text{ Si} + 1.06 \text{ V} + 0.39 \text{ W} + 0.45 \text{ Ta} + 1.35 \text{ Ti} + 0.81 \text{ Zr}$$

where the elemental compositions are given in weight percent.

10. The nickel-chromium-molybdenum alloy of claim 9, also comprising in weight percent:

up to 1	cobalt
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up to 0.2	niobium
up to 0.2	titanium
up to 0.2	vanadium

11. The nickel-chromium-molybdenum alloy of claim 9, also comprising up to 0.5 wt.% copper.

12. A nickel-chromium-molybdenum alloy capable of being age hardened for improved strength while maintaining excellent corrosion resistance, having a composition comprised in weight percent of:

19.92 to 21.41	chromium
15.11 to 17.38	molybdenum
from 0.94 to 2.76	iron
from 0.29 to 1.18	manganese
from 0.11 to 0.21	aluminum
from 0.003 to 0.011	carbon
up to 0.003	boron
up to 0.07	silicon
from 0.09 to 1.06	tungsten
from 0.04 to 2.29	cobalt
from 0.01 to 1.19	niobium
up to 0.46	titanium
up to 0.16	vanadium

up to 0.02 tantalum

with a balance of nickel and impurities, metallic impurities hafnium, tantalum and zirconium each up to 0.5 wt. %, wherein the alloy has a P value of from 33.7 to 35.9, P being defined as:

$$P = 2.64 \text{ Al} + 0.19 \text{ Co} + 0.83 \text{ Cr} - 0.16 \text{ Cu} + 0.39 \text{ Fe} + 0.52 \text{ Hf} + 0.59 \text{ Mn} + 1.0 \\ \text{Mo} + 0.68 \text{ Nb} + 2.15 \text{ Si} + 1.06 \text{ V} + 0.39 \text{ W} + 0.45 \text{ Ta} + 1.35 \text{ Ti} + 0.81 \text{ Zr}$$

where the elemental compositions are given in weight percent.

13. The nickel-chromium-molybdenum alloy of claim 12, also comprising of 0.01 to 0.05 wt.% copper.

14. The nickel-chromium-molybdenum alloy of claim 13, wherein the impurities comprise levels of at least one of sulfur, phosphorus, oxygen, nitrogen, magnesium, and calcium.

15. The nickel-chromium-molybdenum alloy of claim 13, wherein the alloy is in wrought forms selected from the group consisting of sheets, plates, bars, wires, tubes, pipes, and forgings.

16. The nickel-chromium-molybdenum alloy of claim 13, wherein the alloy is in cast form.

17. The nickel-chromium-molybdenum alloy of claim 13, wherein the alloy has been spray-formed.

18. The nickel-chromium-molybdenum alloy of claim 13, wherein the alloy is in powder metallurgy form.